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Author: Robertas Zubrickas

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Market exposure can favor the evolution of inequity-averse preferences.

The effect stems from an opportunity to obtain information rents.

We offer a new explanation to more sociality observed in market-integrated societies.

We predict a positive relationship between market concentration and sociality.

How Exposure to Markets Can Favor Inequity-Averse Preferences

Robertas Zubrickas*

Department of Economics, University of Zurich, Winterthurerstrasse 30, CH-8006 Zurich, Switzerland

Abstract

This paper shows how market exposure can support the evolution of non-individualistic preferences. In a group, one agent is randomly selected to divide an exogenous endowment. Endowment shares are used for either consumption or market exchange with external merchants. As a more equal endowment distribution attenuates the scope of merchants' price discrimination, we argue that inequity-averse preferences may lead to a higher utility of consumption and so survive evolutionary pressures. This effect arises from an opportunity to create and extract information rents. We offer a new explanation to the empirical finding that a society's exposure to markets has a positive effect on its members' sociality.

Keywords:

Evolution of preferences, market integration, inequity aversion, screening, cross-societal differences

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*Email: robertas.zubrickas@econ.uzh.ch; phone: +41 44 634 3586; fax: +41 44 634 49 78

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1. Introduction

A high degree of selfishness exhibited by Machiguenga Indians of the Peruvian Amazon in their play of the ultimatum game set forth the question about the foundations and evolution of social preferences ubiquitously observed in modern industrialized societies (Henrich (2000)). Arguably, studying traditional societies allows us to catch a glimpse of human preferences as of an early stage of social cohabiting and their evolution. For this purpose, a large project was started to collect more evidence on the economic behavior of indigenous people from different small-scale traditional societies (about the project, see Henrich et al. (2001) and Henrich et al. (2004)). Among its main findings is that members of market-integrated societies, as measured by exposure to market exchange, have a stronger preference for equity than do members of isolated societies.[1] Henrich et al. (2004, p. 50–51) leave open the question of what explains the discovered empirical pattern, calling for more research on this finding:

> "The challenge is to understand how and why unselfish behaviors and motives could evolve in the face of the material advantages accruing to selfish individuals."

In this paper, we show how exposure to market exchange can support the evolution of preference for equity of money distribution (Bolton (1991); Fehr and

[1] In general, there is much evidence on influences of the socioeconomic environment on people's preferences. Buchan et al. (2009) find a positive link between a society's level of globalization and socialness of its members. Buchan et al. (2002) document cross-cultural differences in people's propensity to trust and reciprocate. Herrmann et al. (2008) report a cross-societal variation in people's pro- and anti-social punishment behavior revealed in public goods experiments and link this variation to differences in norms of civic cooperation and the importance of the rule of law across countries. See also Bowles (1998).

Schmidt (1999); Bolton and Ockenfels (2000)). The idea is that in a market-integrated society a more equal money distribution can attenuate the scope of merchants' price discrimination and, subsequently, improve terms of trade with them resulting in a higher utility of consumption. Then, with the assumption that increased utility of consumption means increased individual fitness, inequity-averse preferences can be individual fitness maximizing and be favored by cultural selection through enculturation.[2] At the same time, in isolated societies this market effect is absent and selfish preferences would prevail there.

The following example illustrates the idea behind the effect of market exposure. Consider two individuals with an aggregate monetary endowment of 1 and one profit-maximizing producer of a single, non-divisible good. One individual is randomly chosen to divide the endowment between himself and the other individual. Suppose that the resultant distribution of endowment shares is public information, but individual shares are private information. The producer produces the good at a constant marginal cost of 0.1. After endowment division, the producer sets a price of the good that maximizes her profits from simultaneous trades with the two individuals. What is the optimal division of the endowment that maximizes the divider's consumption of the good? If the divider keeps the whole endowment for himself, then his consumption is one unit only as the producer sets the price at 1. Instead, the divider can increase his consumption to two units by giving the other individual one third of the endowment that makes the producer set the price at $1/3$ aiming at both individuals rather than just at the richer one.

[2]The importance of the cultural transmission of behavioral traits among humans was emphasized by Cavalli-Sforza and Feldman (1981). See also Boyd and Richerson (2005). Cultural transmission leads to a much faster selection for traits and has a similar qualitative character of evolutionary dynamics as in models with genetical transmission (Bergstrom (2002)).

Thus, by sharing with others one can increase the purchasing power of one's own share, even diminished. This arises from an opportunity to create and extract information rents. We can think of two approaches to relate this finding with the phenomenon of inequity aversion. The first is rationalistic. In the example, from conventional preferences for consumption we obtain a non-monotonic indirect utility function of money, which can be interpreted to have underlying inequity-averse preferences for money distribution. Hence, it may be that inequity aversion is indistinguishable from rational (in terms of own-consumption maximization) behavior.[3] However, this interpretation is inconsistent with empirical evidence on people's behavior in laboratory money-sharing experiments. If people are that rational to share with others in order to obtain a strategic advantage for future interactions, then they should also realize that no strategic advantage can be obtained from sharing in laboratory experiments, which, nevertheless, they abundantly engage in. This suggests that, when facing a money-sharing decision to make, people may maximize something else than their utility of consumption.

The second approach, which is also the approach of this paper, is that in societies exposed to market exchange inequity-averse people can obtain a higher material payoff than selfish ones. Being more successful, inequity-averse preferences are likelier to survive evolutionary pressures, and, accordingly, the mode of behavior induced by these preferences becomes more common in market-integrated societies. The converse is true for isolated societies that are obsolete in the modern industrialized world, possibly explaining why we may observe more individualistic behavior in some traditional societies not observed elsewhere.

In the present paper, these ideas are developed in a model with evolution of preferences (Güth and Yaari (1992)). In line with the general approach (Ely

[3]Similarly, Postlewaite (1979) shows the possibility of utility gains from endowment manipulations in competitive markets.

and Yilankaya (2001); Ok and Vega-Redondo (2001); Dekel et al. (2007)), we distinguish between *subjective* preferences and *objective* payoffs. Objective payoffs are determined by individual evolutionary fitness, which we assume to be the utility of private consumption. Subjective preferences are defined over the distribution of endowment shares in the population and individuals maximize these preferences when confronted with the problem of endowment division. We study the question the maximization of what subjective preferences also maximizes objective payoffs, i.e., evolutionary fitness.

Finally, this paper contributes to the evolutionary literature by providing an empirically supported argument on how non-individualistic preferences can survive evolutionary pressures in the *individual selection* framework. Usually, evolutionary models in favor of non-individualistic preferences rely on a group-selection argument in the standard approach (for a review, see Bergstrom (2002); Salomonsson (2010)) or certain informational assumptions about the observability of preferences in the "indirect" or evolution of preferences approach (Dekel et al. (2007)). Altruistic preferences are also found to survive evolutionary pressures in local interactions (Eshel et al. (1998)). This paper, however, bypasses all of the above: the result hinges on the strategic sharing effects described, i.e., information rents.[4]

The remainder of the paper is organized as follows. Section 2 introduces the model. Section 3 deals with objective payoffs in different market structures and Section 4 with evolutionary stable preferences. Section 5 offers an extension related to market concentration and preferences. Section 6 discusses robustness and empirical evidence. The last section concludes.

[4]Certainly, this paper is not unique in showing how individual selection can favor social preferences, see, e.g., Becker (1976).

2. The model

2.1. Set-up

Consider a village of $N \geq 2$ farmers, who have an aggregate endowment of a perfectly divisible *local* good of size $S > 0$. Let a vector $\mathbf{s} = (\mathbf{s}_1, ..., \mathbf{s}_N)$ denote the farmers' individual shares of the endowment, where $\mathbf{s}_i \in [0, S]$ and $\Sigma_i \mathbf{s}_i = S$.

The consumption of an endowment share $\mathbf{s}_i$ renders the farmer i an objective utility of $u(\mathbf{s}_i)$, where $u' > 0$ and $u'' < 0$. Endowment shares can also be used as a means of exchange for trades with external merchants if the village is accessible for them. External merchants can offer farmers a non-divisible *outside* good in various quality $q > 0$. We assume that every farmer has a demand for at most one unit of the outside good. A farmer i's objective utility from the consumption of a variety q when priced at $p \leq \mathbf{s}_i$ and of the remainder of own endowment share, $\mathbf{s}_i - p$, is given by $U(\mathbf{s}_i - p, q)$. The utility function U is increasing and strictly concave in both arguments and has a positive cross derivative.

Suppose that farmers have subjective preferences over the distribution of endowment shares in the village, characterized for a farmer i by the function V_i

$$V_i(\mathbf{s}) = \mathbf{s}_i - \frac{\alpha_i}{N-1} \sum_{j \neq i} g\left(\{\mathbf{s}_j - \mathbf{s}_i\}^+\right) - \frac{\beta_i}{N-1} \sum_{j \neq i} g\left(\{\mathbf{s}_i - \mathbf{s}_j\}^+\right). \tag{1}$$

In (1), $\mathbf{s}_i$ is own endowment share, $\alpha_i \in [0, \overline{\alpha}]$, $0 < \overline{\alpha}$, and $\beta_i \in \left[0, \overline{\beta}\right]$, $0 < \overline{\beta}$, are subjective preference parameters, where $\alpha_i \geq \beta_i$, and g is an increasing, strictly convex function with $g(0) = 0$. The second term of (1) measures the subjective utility loss from disadvantageous inequality, and the third term measures the loss from advantageous inequality.[5]

[5]The preference specification (1) is based on Fehr and Schmidt (1999). The function g imposes a non-constant marginal rate of substitution between own share and endowment inequality.

The model contains three stages. In Stage 1, endowment division takes place. In Stage 2, external merchants offer a menu of different varieties of the outside good. In Stage 3, trades take place and utilities are realized.

2.2. Endowment division

In Stage 1, Nature randomly selects a farmer $i \in \{1, ..., N\}$ to divide at own discretion the endowment S into a vector of shares $\mathbf{s}$. The optimal division $\mathbf{s}^*$ maximizing own subjective utility is given by

$$\mathbf{s}^* = \arg\max V_i(\mathbf{s}). \tag{2}$$

We can immediately make two observations about $\mathbf{s}^*$. First,

$$\mathbf{s}_i^* = \max(\mathbf{s}^*), \tag{3}$$

i.e., the divider's share has to be the largest. Otherwise, he can increase his utility by redistributing the difference between the largest share and his own share equally among all the farmers with lower shares. Second,

$$\mathbf{s}_j^* = \frac{S - \mathbf{s}_i^*}{N-1}, \quad j \neq i. \tag{4}$$

From the first observation, we can ignore the second term in (1). Then, because of the strict convexity of g, the maximum of V_i is reached when the remainder of the endowment is distributed equally among the other farmers.

Thus, the optimal division $\mathbf{s}^*$ is fully characterized by the divider's own share $\mathbf{s}_i^*$, which, in turn, is determined by his preference parameter β_i.[6] We define $\psi : [0, \overline{\beta}] \to [0, S]$ to be a mapping from β_i into the optimal own share $\mathbf{s}_i^*$. Due

[6]The parameter α for disadvantageous inequality will be irrelevant for the subsequent analysis and not be considered henceforth. Yet, by estimating β, we also obtain the lowest bound of α since $\alpha_i \geq \beta_i$.

to the convexity of g, the mapping ψ is monotonically decreasing in β_i. In order to have a one-to-one mapping, we assume $\overline{\beta}$ such that ψ is a strictly monotone function with $\psi(0) = S$ and $\psi(\overline{\beta}) = S/N$.

Finally, let the distribution of endowment shares in the village be public information, whereas individual shares private.

2.3. Market exchange

In Stage 2, profit-maximizing merchants offer farmers a take-it-or-leave-it menu of price-quality (p, q) varieties of the outside good. The production of the variety $q > 0$ costs $C(q)$, where $C' > 0, C'' > 0$, and $\lim_{q\to 0} C(q) = 0$. The returns to scale from producing a given variety are constant and the total costs of producing several varieties are additively separable in each variety.

Given a unit demand, a farmer i considers purchasing a variety (p, q) only if it results in a non-negative net utility level ΔU defined as

$$\Delta U(p, q, \mathbf{s}_i) = U(\mathbf{s}_i - p, q) - u(\mathbf{s}_i). \tag{5}$$

The properties of net utility ΔU are $\Delta U_q > 0, \Delta U_{qq} < 0, \Delta U_{\mathbf{s}_i} > 0$, and $\Delta U_{q\mathbf{s}_i} > 0$, which immediately follow from the assumptions on U and u. Given a menu of varieties, a farmer chooses the variety, if any, that maximizes his net utility ΔU. Finally, farmers have no bargaining power in their trade with merchants.

We consider three different forms of market exchange. The first one is autarky (the village is not accessible for merchants). The second one is monopoly (the village is accessible for only one merchant). The third one is perfect competition (the village is accessible for many merchants).

3. Objective payoffs

In this section, we abstract from farmers' subjective utility considerations and are interested in their expected objective utility of consumption, henceforth, objective payoffs, resulting from different divisions of the endowment. In what follows, let $\sigma_i \in [0, S]$ denote the endowment share a farmer i's keeps for himself if selected to be the divider, with the rest of the endowment, $S - \sigma_i$, divided equally among the other farmers. For each form of market exchange, we construct a game with farmers' objective payoffs and solve for the equilibrium strategy profile $\sigma = (\sigma_1, ..., \sigma_N)$.

3.1. Autarky

In the absence of market exchange with external merchants, a farmer i's objective payoff from a strategy profile σ is given by

$$\Pi_i^A(\sigma) = \frac{1}{N} u(\sigma_i) + \sum_{j \neq i} \frac{1}{N} u\left(\frac{S - \sigma_j}{N - 1}\right). \tag{6}$$

The first term is the farmer's objective utility of own share σ_i, multiplied by the probability of being the divider. The second term is the probability-weighted sum of objective utilities of shares received from the other farmers. Since own strategy σ_i has no effect on the second term of Π_i^A, in the autarky game $\Gamma^A = \{\sigma_i, \Pi_i^A\}_{i=1}^N$ the unique equilibrium strategy for every farmer i is $\sigma_i^A = S$.

3.2. Monopoly

To determine farmers' objective payoffs with monopolist market exchange, first, we need to solve for the optimal menu of varieties offered by the merchant for a given distribution of endowment shares. Since individual shares are private information, the design of a menu of varieties is a hidden-information problem (Mussa and Rosen (1978)).

As there can be at most two distinct endowment shares resulting from a strategy σ_i, denote the larger share by s_1 and the smaller by s_2. Let π_1 and π_2 denote their corresponding probabilities in the distribution of the endowment. The merchant offers at most two varieties $\{(p_1, q_1), (p_2, q_2)\}$ that maximize her expected profit per trade $\pi_1(p_1 - C(q_1)) + \pi_2(p_2 - C(q_2))$ subject to farmers' incentive compatibility and individual rationality, respectively,

$$\Delta U(p_j, q_j, s_j) \geq \Delta U(p_k, q_k, s_j) \tag{7}$$

$$\Delta U(p_j, q_j, s_j) \geq 0, \quad j = 1, 2 \text{ and } k \neq j \tag{8}$$

where a variety (p_j, q_j) is aimed at a farmer with the share s_j, $j = 1, 2$.

The merchant offers two distinct varieties if the difference in endowment levels, $s_1 - s_2$, is not too large. Then, the optimal menu $\{(p_1, q_1), (p_2, q_2)\}$ has the individual rationality constraint of the poor farmer and the incentive compatibility constraint of the rich farmer binding (the single-crossing property ensures that the other incentive compatibility constraint holds). In this case, the rich farmer enjoys a positive information rent, $\Delta U(p_1, q_1, s_1) > 0$, whereas the poor has none, $\Delta U(p_2, q_2, s_2) = 0$. If the difference $s_1 - s_2$ is sufficiently large or $s_1 = s_2$, the merchant designs only one non-zero variety (p_1, q_1), but for which $\Delta U(p_1, q_1, s_1) = 0$.

Given the merchant's optimal menu, a farmer's indirect utility function $Y(s)$ of own endowment share s is given by

$$Y(s) = \begin{cases} u(s) & \text{if} \quad 0 \leq s < S/N, \\ u(s) + \Delta U(p_1, q_1, s) & \text{if} \quad S/N \leq s \leq S - (N-1)\underline{s}, \\ u(s) & \text{if} \quad S - (N-1)\underline{s} < s \leq S, \end{cases} \tag{9}$$

where $\underline{s}$ is the smallest value of s_2, determined endogenously, for which poor farmers are offered a non-zero variety. In words, the indirect utility function Y has three parts. The first part is relevant for the poor farmer, the second for the rich farmer when poor farmers matter to the monopolist, and the third for the rich farmer when poor farmers do not matter to the monopolist.

Denote the maximizer of Y over the restriction $[S/N, S - (N-1)\underline{s}]$ by

$$\overline{s} = \arg\max(Y(s) \mid S/N \leq s \leq S - (N-1)\underline{s}). \tag{10}$$

The function Y attains its global maximum at either $\overline{s}$ or S. The condition for the interior global maximum is

$$U(\overline{s} - p_1, q_1) \geq u(S). \tag{11}$$

In the monopoly setting, sharing with others can lead to a higher utility of consumption than when keeping the whole endowment. This effect arises from information rents available with less unequal endowment distributions. For condition (11) to hold, the size of information rent matters, which, on the other hand, is dependent on the form of the utility function U. Intuitively, condition (11) is likelier to hold when farmers after a certain point become quickly satiated with the consumption of the local good and value the outside good highly enough. (See the numerical example below that illustrates the points raised.)

A farmer i's objective payoff from a profile σ is

$$\Pi_i^M(\sigma) = \frac{1}{N} Y(\sigma_i) + \sum_{j \neq i} \frac{1}{N} Y\left(\frac{S - \sigma_j}{N-1}\right). \tag{12}$$

In the monopoly game $\Gamma^M = \{\sigma_i, \Pi_i^M\}_{i=1}^N$, the unique equilibrium strategy for every farmer i is $\sigma_i^M = \overline{s}$ if condition (11) holds (also suppose that if we have $Y(\overline{s}) = Y(S)$ then farmers prefer the less unequal split), and otherwise $\sigma_i^M = S$.

3.3. Perfect competition

In a competitive market, the zero-profit condition implies that $p = C(q)$ for every variety (p, q) offered. Furthermore, a variety (p, q) aimed at a farmer with an endowment share s has to maximize the farmer's utility $U(s - p, q)$, which, together with $p = C(q)$, implies

$$U_2(s - p, q) - U_1(s - p, q)C'(q) = 0, \tag{13}$$

where U_1 and U_2 are partial derivatives with respect to the first and second argument, respectively. The total derivative of net utility $\Delta U(p, q, s)$ with respect to own endowment share s is (omitting the arguments)

$$\frac{d\Delta U}{ds} = \Delta U_p C' \frac{dq}{ds} + \Delta U_q \frac{dq}{ds} + \Delta U_s = \Delta U_s > 0, \quad (14)$$

which is obtained using (13) and $\Delta U_q = U_2$ and $\Delta U_p = -U_1$.

Farmer i's objective payoff Π_i^C from a strategy profile σ is

$$\Pi_i^C(\sigma) = \frac{1}{N}\left[u(\sigma_i) + \Delta U(p_i, q_i, \sigma_i)\right] + \sum_{j \neq i} \frac{1}{N}\left[u(s_j^{\#}) + \Delta U(p_j, q_j, s_j^{\#})\right], \quad (15)$$

where $s_j^{\#} = (S - \sigma_j)/(N-1)$, p and q are competitive price and quality levels. Since ΔU increases in own endowment share, in the competition game $\Gamma^C = \{\sigma_i, \Pi_i^C\}_{i=1}^N$ the unique equilibrium strategy is $\sigma_i^C = S$.

3.4. Monopoly example

For monopolist market exchange, consider the following specification of the model : $N = 2$, $S = 50$, $u(s) = s^a$, where $0 < a < 1$, and $U(s-p, q) = (1+q)(s-p)^a$.[7] The merchant's production function is given by $C(q) = q^2$. Figure 1 plots the indirect utility function Y for different values of $a = 0.5, 0.7$, and 0.9. The function Y has an interior maximum and the corner maximum. The coordinates of the global maximum are given in bold. For lower values of a, i.e., when farmers value the local good relatively less, the interior maximum is global. But for $a = 0.9$ the interior maximum is not global. In this example, the condition equivalent to (11), when farmers are better off by sharing with others, is that $a < 0.749$.

[7] With this form of function U we do not have the strict concavity in q assumed in the paper, but for this example it is immaterial. Otherwise, at the expense of some more computation, we could have used $U(s-p, q) = (1+q)^z(s-p)^a$ for some z, $0 < z < 1$.

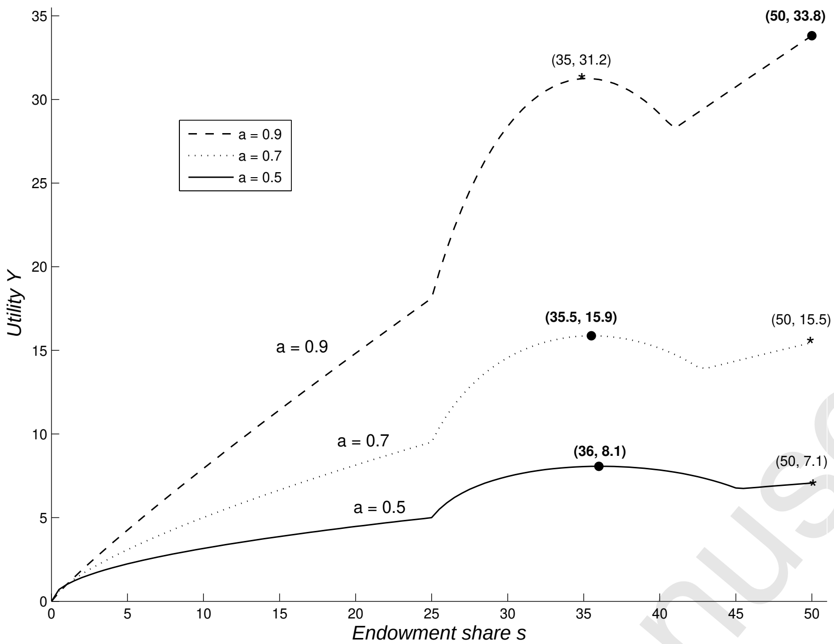

Figure 1: Indirect utility Y

4. Evolution of preferences

In this section, we address the question of what subjective preferences, characterized by the inequity-aversion parameter β, are favored by cultural selection, with their share in the population increasing at the expense of other less successful preferences. The approach is that of evolution of preferences or "indirect" evolution with a static stability concept of equilibrium so that in equilibrium no mutation can give a higher objective payoff than that of the incumbent types (Güth and Yaari (1992); Ely and Yilankaya (2001)). Based on the results of Ely and Yilankaya (2001), for different forms of market exchange evolution selects the subjective preferences that lead to the choice of equilibrium strategies of the corresponding game Γ. We call these subjective preferences evolutionary stable.[8]

In each game Γ studied, there is a unique and symmetric equilibrium strategy σ_i for every farmer i. The evolutionary stable subjective preference type β is given then by $\beta = \psi^{-1}(\sigma_i)$, where ψ^{-1} is the inverse of the mapping ψ from a preference type β to the optimal own endowment share. The proposition below summarizes the resultant evolutionary stable preferences.

Proposition 1. *The evolutionary stable preference types are*

- *in autarky,* $\beta^A = 0$;
- *in monopoly, if (11) holds, then* $\beta^M = \psi^{-1}(\overline{s}) > 0$, *where* $\overline{s}$ *is defined by (10), otherwise,* $\beta^M = 0$; *and*
- *in perfect competition,* $\beta^C = 0$.

In words, farmers can gain a material advantage from sharing under monopolist market exchange. This is due to the opportunity to create and extract information rents. However, this opportunity is missing in competitive markets and in autarky. There, we expect selfish types to prevail.

5. Market concentration and preferences

Drawing on Proposition 1, we can postulate a positive relationship between the degree of market concentration and the intensity of inequity aversion. To study formally this relationship in our framework, we can proceed as follows. Suppose

[8] To apply the results of Ely and Yilankaya (2001) directly, we would need to discretize our model. However, since the existence of equilibrium is not an issue in our games studied, then the results of Ely and Yilankaya (2001) apply to our setting as well despite a continuous action space. For pitfalls lying with using continuous action spaces, see Oechssler and Riedel (2002).

that $L \geq 1$ merchants can reach the village and that the probability $f(L)$ of collusion among the merchants decreases with their number, where $f(1) = 1$ and $\lim_{L\to\infty} f(L) = 0$. If merchants fail to collude, then they are in the state of perfect competition. Similarly to the previous analysis, for market exchange with L merchants we define a game $\Gamma^L = \{\sigma_i, \Pi_i^L\}_{i=1}^N$, where a farmer i's objective payoff is given by

$$\Pi_i^L(\sigma) = f(L)\Pi_i^M(\sigma) + (1 - f(L))\Pi_i^C(\sigma), \tag{16}$$

where Π_i^M and Π_i^C are the objective payoffs in the monopolist and competitive markets, defined by (12) and (15), respectively. We note that $\Pi_i^C(\sigma) > \Pi_i^M(\sigma)$, which follows from the consumer surplus in the competitive market being greater than the information rent in the monopolist market. Clearly, with condition (11) satisfied, the equilibrium strategy for $L = 1$ is $\sigma_i^L = \overline{s}$, defined by (10). If $\overline{s} \in (S/N, S - (N-1)\underline{s})$, implying the continuity of the indirect utility Y at $\overline{s}$, then the equilibrium strategy σ_i^L will increase at least for some L. The reason is that with the competitive market more likely to emerge the divider keeps more of the endowment to benefit from a higher consumer surplus sacrificing some information rent in the monopolist market. This implies a lower evolutionary stable preference parameter $\beta^L = \psi^{-1}\left(\sigma_i^L\right)$. Thus, with more competitive markets and, accordingly, with less price discrimination, income inequality has weaker adverse effects on the level of consumption utility.

6. Discussion

The main result of this paper is that exposure to markets can support the evolution of non-individualistic preferences even in the individual selection framework. Next, we discuss the robustness of this result with regard to different modeling assumptions. Afterwards, we discuss empirical evidence.

6.1. Robustness

Regarding endowment division, exposure to market exchange, independently of the endowment sharing rule, will favor preferences that lead to a more equal endowment distribution if it results in sufficiently high information rents. But at the same time, these preferences would not survive in autarky, implying the relevance of market exposure for the formation of preferences. As for the sharing rule used in the present paper, we essentially claim that even with the most selfishness-enhancing rule the norm of sharing can still evolve. From a different perspective, in the presence of positive income redistribution effects we are more likely to observe the development of pro-social sharing norms.

Regarding the informational assumptions, the private information assumption is not restrictive. Under complete information, if the monopolist merchant cannot prevent resale in other markets then he cannot do better than designing the optimal incentive compatible menu. As for the assumption that endowment distribution is public information, it is either in the interest of the divider himself to make the division of the endowment public or, otherwise, poor farmers have no incentive to conceal the distribution of endowment shares.

Finally, regarding the monopolistic screening, arguably beyond the level of sophistication of early humans, it is not behind the main result either. Non-discriminatory pricing, as shown in the introduction, qualitatively leads to the same result.

6.2. Empirical evidence

As discussed in the introduction, in response to the finding of Henrich (2000), which proves the behavior of Machiguenga Indians more selfish than typically observed in modern societies, a cross-cultural project was started to inquire into this finding more thoroughly. In this project, documented in Henrich et al. (2001)

and Henrich et al. (2004), indigenous people from 15 different small-scale societies from around the world took part in experiments consisting of their playing ultimatum, public good, and dictator games.

After regressing the measure of sociality on individual and societal characteristics, several empirical regularities were discovered. First, there is considerably more behavioral variability across the traditional societies studied than had been found in any study on modern societies. Second, no individual-level economic or demographic variable can explain any variation in behavior either within or across the societies. Lastly, the researchers observed two between-group differences in people's behavior. The first one is related to the importance of cooperation in a society's economic production and the second to the degree of market integration (as measured, primarily, by exposure to external markets). Both factors are positively related to the amount of sociality exhibited and together they account for about a half of its variation across societies with each of these factors equally important.

These findings are based on the results of the regression run using the pooled data from all the societies studied in the project. The finding that there is a positive link between market integration and amount of sociality, with causation running from market integration, is also supported by an individual study within this project. Ensminger (2004) is a study on the society of Orma of East Africa, which has a significant variation in market involvement among its different societal groups. One of the specific questions raised in this study is whether there is an effect of market integration on fairness norms (mean offers in the experimental games conducted) of the Orma people. Ensminger (2004) finds a strong positive effect and concludes that the behavior of the Orma people is consistent with the general finding of the project that fairness increases with market integration. In particular, it is suggested that fairness is learned in the course of market exchange and these socializing effects of the market permeate other spheres of everyday life.

7. Conclusion

In this paper, we show how inequity-averse preferences can survive evolutionary pressures in societies exposed to market exchange. We argue that the effect of market exposure on the evolution of preferences arises from an opportunity to extract information rents. Our results offer a new explanation to the empirical finding of Henrich et al. (2001) and Henrich et al. (2004) about more sociality observed in market-integrated societies. We also predict a positive relationship between the degree of market concentration and amount of sociality.

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